Thecus
NVR System 3.4
Server Administration

Thecus NVR System 3.4 Server Administration

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1 Introduction

Thank you for choosing Thecus NVR System 3.4 as the management software for your video monitoring system. As you use it, you will find that NVR System not only enables you to view live images and record them, but also provides a full-scale platform for the intelligent utilization of your video data.

This handbook supports a Thecus distribution partner or an end user in installing the NVR System software on a system server.

Please read the following chapters carefully and follow the directions and recommendations. This assures that your video monitoring system will be up and ready as fast and reliably as possible.

Prepare for installation by assuring that the following information is ready. This information is necessary in order to make all NVR System functionality available:

- Hostname
- IP address, network mask and gateway address of the computer on which you want to install NVR System
- IP address and domain name of your e-mail server (optional)
- IP address of your timeserver (optional)
- IP address of your domain name server (optional)
- Mail domain name and e-mail address of your system administrator (optional)

Caution: NVR System requires a dedicated computer! For reasons of security, it is not possible to use an NVR System server for other systems or purposes! Any data on the hard disks of the computer will be deleted during installation of NVR System. Therefore please back up any needed data before installing NVR System.
The NVR System installation DVD-ROM automatically installs the operating system Linux as well as NVR System on your computer.

1.1 The NVR System documentation set

These documents are available:

- *Thecus NVR System 3.4 User Manual*
- *Thecus NVR System 3.4 Supported Video Sources*
- *Thecus NVR System 3.4 Server Installation and Administration*
- *Thecus NVR System 3.4 Server and Client Compatibility*
- *Thecus NVR System 3.4 SNAP XML Interface*

These documents are available online as PDFs directly on each NVR System server via the standard web interface and also from each client via the **Info** menu at the lower right corner.

1.2 What is new with this release

The new features of releases are always documented on www.netavis.net.

Additionally, the changes of a release are also documented in the **Release Notes**, which you can find on the standard web interface of each NVR System server and also under the following direct link:

http://<your-server>/relnotes

or on the public demo server

showroom.netavis.net/relnotes

There you also find the release information of previous releases.

2 Hardware installation

Similar to other security-oriented systems, NVR System must run on a dedicated computer and it employs a server-grade Linux operating system.

2.1 Hardware requirements / compatibility

Regarding the most actual hardware compatibility please see the document *Thecus NVR System 3.4 Server and Client Compatibility* or consult our web.

The processor and memory requirements on your server depend on the size of your system (number of cameras and users). Ask your Thecus solution partner to help you specify your system.

- However, we suggest an Intel Pentium 4 processor (min. 2.4 GHz) and **1024 MB RAM**.
- You need a DVD-ROM drive for installing which can be built-in or connected via USB as an external device.
- Client on server installations need more CPU power and RAM in the server for the additional client GUI. Details can be found in the document *Thecus NVR System 3.4 Server and Client Compatibility*.

Caution: Most troubles during the installation of NVR System come from unsupported hardware components!

2.2 Hard disks and storage devices

NVR System offers various options for hard disks and storage devices. Currently you can use hard disks in the server, network storage devices and other special storage devices.

2.2.1 Hard disks

NVR System supports server setups with any number of hard disks. However, if you want to use the NVR System software RAID feature you must have at least 2 disks (see below for further details).

NVR System also supports server systems with SCSI hard disk drives and various SCSI controllers supported by the underlying operating system. If you intend to use SCSI hard disk drives, please employ the above link to check the compatibility of the SCSI controller that you plan to use.

NVR System can also be configured on systems with hardware RAID (please refer to install option noraid for no software RAID in *3.1 Installation from scratch* on page 9).

How NVR System software RAID works

For systems with 2 or more hard disks NVR System uses a software RAID 1 be default. This means that all data (operating system, application components, and database) except image data are redundantly stored on the first 2 disks. The image data themselves are not stored redundantly and are distributed across all available disks (also across the remainder of the two system disks).

In case of a hard disk failure of one of the 2 software RAID system disks, the system can still be booted from the remaining hard disk and still operate. The broken system disk should be replaced and then NVR System makes sure that the system data are copied to the replaced disk so that the software RAID is intact again (see *7.1 Dealing with a broken disk* on page 26 for further details).

For a system with 1 hard disk there is no software RAID installed.

2.2.2 Network storage and other storage devices

NVR System also supports server systems with external NAS (network attached storage), SAN (storage area network) devices and other devices any devices for which you can obtain a stable Redhat Linux driver.

2.2.3 Adding a new hard disk or storage device

If you want to add a new hard disk directly to the server refer to *9.23 [23] Add image storage hard disk* on page 45.

If you want to add a NFS-based NAS device refer to *9.17 [17] NAS management* on page 41.

If you want to add a special, manually mounted storage device refer to *9.18 [18] Add manually mounted image storage* on page 43.

To replace a broken hard disk refer to *7 Dealing with broken disks and unbootable servers* on page 26.

2.3 Configuring firewalls

All server to server and server to client network connections can work exclusively via the standard HTTP TCP port 80.

If you want to offload the HTTP port 80 for better performance you can open TCP ports 33331, 33332, and 33333 additionally. It is suggested to open these ports for faster communication and less communication overhead. This is especially relevant for low-bandwidth connections with transcoding (see Transcoding™ in the document *Thecus NVR System 3.4 User Manual*).

For distributed upgrades the TCP ports 10002 and 10003 are currently needed in addition.

2.4 Client on server installations

Normally you would run the NVR System client and server on separate computers (a classical client/server application). However, we also support to run the client GUI on the server console directly (the monitor connected to the server's graphics interface). Every server is installed with this capability, but by default it is switched off.

Please consider that your server might need more CPU power and RAM to handle the additional client GUI.

You can use the administration commands *9.19 [19] Client on server screen resolution* on page 43, *9.20 [20] Client on server autostart config* on page 44, and *9.21 [21] Client on server restart now* on page 45 configure and start the client GUI on the server.

3 Software installation

Before you start installation you must decide whether this is

- a new installation from scratch (all data on the hard disks will be lost) or
- an upgrade of an existing NVR System installation (the database and settings will be preserved)

Please note: For upgrading please refer to *5 Upgrading NVR System* on page 21 and do not just boot and run the upgrade command!

3.1 Installation from scratch

Preparations:

- You need a DVD-ROM drive for installation. Set the boot sequence in the BIOS of your computer to allow for booting from the DVD-ROM drive.
- If you plan to interconnect NVR System servers in different time zones the BIOS clock must be set to GMT time zone (UTC). For installations of servers in one time zone or local installations you can use the local time in BIOS.
- Unnecessary onboard components can be deactivated, e.g. firewire interface. This is necessary on systems with grabber cards where digitizing performance is degraded when interrupt lines overlap. Freeing up interrupt lines by disabling unused hardware elements can eliminate this problem. However if you boot from a DVD-ROM drive connected via USB then you cannot disable the USB interface, of course.

Caution: The server on which NVR System runs must be used exclusively for NVR System. During installation of NVR System all data on the computer's hard disks are deleted!

Please follow these steps:

1. Insert the NVR System Installation DVD in the DVD-ROM drive and turn on your computer. You will see the following message:

```
Welcome to NVR System X.X.X Installation and Upgrading!

 Type install <options> for installation.
Warning: all data on your hard disks will be erased!

Use upgrade <options> only if you are instructed to
do so in the admin upgrade menu (point 5a).

<Options> can be:
<no_option> standard installation/upgrade.
            This will install software RAID if you have
            more than 1 hard disks. (If you have only 1 hard disk
            installed, no software RAID will be installed.)
noraid      installation/upgrade without software RAID.
nus         installation with extended event database and no
            archive capacity.
part        installation/upgrade with manual partitioning.
            Warning: only for experts, please read the installation
            manual.
nlis        installation with no local image storage. To store images
            you must configure external image storage (NAS).
bigdb       installation with extra big index and event database
            needed if image storage in total is bigger than 1 TB.
```

```
Type repair for repairing an unbootable system.

boot:
```

2. Select one of the install options. If you upgrade (you rebooted after starting the upgrade from the admin menu) then you have to choose an upgrade option.

   The meaning of the menu points is:

install	installs a new NVR System system from scratch and all data on the hard disks will be deleted. Please see options below for a more detailed description of what exactly happens at installation.
upgrade	upgrades an existing system to a new release. For details about upgrading please refer to *5 Upgrading NVR System* on page 21. Caution: Run this command only when you are told to do so during the upgrade process!
repair	allows you to repair a NVR System system that is unable to boot because of a hard disk or boot partition error. Please refer to *7 Dealing with broken disks and unbootable servers* on page 26.

   Available options are (please note that options can be combined):

<no_option>	if no options are supplied, then a standard installation / upgrade is executed. The installation routine automatically detects the number of connected hard disk drives and conducts correct partitioning of the available capacity. For systems with 2 or more hard disks a software RAID 1 for all data (operating system and database) except image data. The image data themselves are distributed across all available disks. For a system with 1 hard disk there is no software RAID installed. If you do not want to install a software RAID please refer to option **noraid** below.
noraid	installs / upgrades the system without a software RAID. This option should be chosen if you have a hardware RAID installed and several disks visible for partitioning.
nus	installs a NVR System server with extended event database and no archive capacity. This is useful for NVR System systems that have to keep track of many events and where one or more servers are dedicated to event storage. Such servers need to be setup with the **nus** option. For upgrades this option needs not to be specified since the upgrade scripts recognize such a nus installation automatically.
part	installs / upgrades a server with manual partitioning of hard disks. Manual partitioning has to be chosen only in very special cases and should be executed only by experts and trained people. Special cases where you want to use manual partitioning are for example if you use a hardware RAID configurations with more than 1 visible hard disks or if you use external storage systems (like NAS or SAN) in which case the operating system cannot automatically determine the disk drivers and space allocated for you. If you partition manually, be sure to provide separate partitions according to the following table (please note that Linux is case-sensitive):

Partition (mount point)	Size / description
/	min. 2 GB
/boot	min. 100 MB
/netavis	min. 2 GB
swap	Size should be equal to RAM, max. 1 GB. For NVR System the suggested RAM size allows a system that needs only

		little swapping. Therefore the swap partition should not be too large since it slows system performance.
	/var/lib/mysql	This partition contains the image storage index and all events in a database. As a rule of thumb it must be app. 1/60 of the total size of all image partitions, e.g. 1 GB for a total of 60 GB image partitions size. Following extreme configuration cases might require to reserve more space for this partition: • For very long-term image recordings (like 5 years) with many cameras (like 100) with very low frame rates (like 2 frames per hour) and small images sizes (like CIF) the relation between overall image storage and needed space on this partition can be less than 1/60. For such extreme cases you should take a 1/30 ratio. • For storage of very many events (like more than 300'000) you should also increase the size of this partition above the ratio of 1/60 overall image storage. 1 stored event needs app. 1 KB, so additional 100'000 stored events need app. 100 MB additional space in this partition.
	/Images/Images[n]	Size should be whatever you have available. The first image partition must be mounted under /Images/Images1. You can install several images partitions (e.g. 1 for each hard disk) that must be mounted under /Images/Images2, /Images/Images3 and so on. From release 3.3 on the image partitions can have different sizes (prior to release 3.3 all image partitions needed to be of the same size). During manual partitioning, be sure to observe the ratio between the size of the database partition /var/lib/mysql and the total of the image partitions, even if you have located them on NAS or SAN storage systems or mounted them via a network file system.
nlis	installs a server with no local image storage (the local hard disk will not be used for image storage). If you plan to use external image storage then you should use this option. You must configure external image storage (NAS). See *9.17 [17] NAS management* on page 41.	
bigdb	installs a server with extra big index and event database. Choose this option if you plan to use image storage in total of more than 1 TB (terabytes). This option influences the size of the /var/lib/mysql partition which normally is 5 GB. If you choose this option it is increased to 25 GB. See also the description /var/lib/mysql in the **part** option above for further details on this.	

3. Next you will be prompted to select the language for the installation process (default is English).

   Please note: This is not the language of the NVR System client GUI but only for the operating system and the remainder of the installation process. NVR System supports many languages which can be selected later.

   You can navigate through the list using the cursor keys. Select your preferred language, e.g. ENGLISH, and press **ENTER**.

4. Next you will be asked to specify the keyboard layout for your system. You can navigate through the list using the cursor keys. Select your preferred keyboard layout, e.g. **de-latin1-nodeadkeys** for the German keyboard and press **ENTER**.
5. In case you selected manual partitioning (**install part**) you will then be prompted for it. Select **Disk Druid** and partition the hard disk(s) according to the explanations given above. If you did not select manual partitioning, you can ignore this step and continue. If this is an upgrade then

execute according to the explanations given by the admin upgrade command (see *5 Upgrading NVR System* on page 21).

6. Next you need to set the time zone in which the system will operate.

   If you have set the BIOS CMOS time to GMT (UTC) then activate **System clock uses UTC** by pressing the **SPACE** bar. Otherwise you need not to activate this checkbox.

   Move the cursor to the time zone settings by pressing the **Tab** key. Select the appropriate time zone using the **Cursor** keys e.g. Europe/Vienna. Please note that you can also use accelerator keys for faster navigation e.g. press the key that corresponds to the first letter of the name of the time zone (**E** for Europe) or use the **Page-Up** and **Page-Down** keys. Press the **Tab** key to jump to **OK** and confirm your selection with **ENTER**.

7. If you did not choose manual partitioning and you have completed these inputs, Linux will be installed automatically without further prompts. Should the installation not succeed, assure that your hardware has been installed correctly. Then start the installation anew.

   On completion of the installation, a message is displayed to indicate success.

8. Remove the DVD-ROM from the DVD-ROM drive and press **Enter** to reboot the system. On rebooting, usually the DVD drive closes automatically.
9. When rebooting the first time, it is possible that you will be asked to configure newly detected hardware like grabber cards (with Bt878 chips). You will be prompted for each chip of the grabber card. Just press **Enter** at the prompts to configure all of them. After that the reboot will continue.
10. Continue with *3.2 Finalizing the installation and basic settings* on page 12.

3.2 Finalizing the installation and basic settings

3.2.1 Finalizing the installation

1. After the system reboots, you will be prompted to login as administrator user:

```
Welcome to NETAVIS!

Please login as admin to manage your system

videosystem login:
```

2. Enter **admin** and press **ENTER**.

   Once you have logged in, you will see an admin menu like:

```
Please make your selection:

[0] Finalize installation
[q] Quit
```

3. Please enter **0** and press **ENTER** to select the menu point **Finalize installation**.

   Now the license agreement for NVR System will be displayed. Read the license agreement and push the **Space** bar to scroll to the end.

```
Do you agree with the NETAVIS Enduser License Agreement? (yes/no):
```

4. If you agree, enter **yes** and press **ENTER**.
   Now you will be prompted to define the password for the **admin** user:

```
Changing password for admin user
Please set a password for your account:
```

```
Changing password for user admin:
New UNIX password:
```

5. Please type in the password and press **ENTER**. If the password you selected is shorter than 8 characters, then a short message will inform you about that. However, also a shorter password will be accepted and you will be prompted to enter the password again:

```
Retype new UNIX password:
```

6. Enter the password again (in our case **admin**) and press **ENTER**.

Caution: You must remember your **admin** password or note it somewhere. You need it later on to access the admin menu and change the system settings of your server.
If you lost your **admin** password please refer to *9.13.1 Lost admin password* on page 41.

Now you are done with the installation and you will be prompted for the basic systems settings. Prepare for installation by assuring that the following information is ready and continue with the next steps.

3.2.2 Basic system settings

Again, follow the instructions of the installation program according to these steps:

1. The installations script proposes the hostname **videosystem**. You can leave this name or change it:

```
Now you need to set up initial network configuration

Network hostname (one word without dots) [videosystem]:
```

Press **ENTER** if you are accepting this default value or type in your desired name e.g. myNetavis and press **ENTER** to acknowledge your input.

2. Now you are called upon to accept your input of the hostname:

```
Save values, Edit again, Revert to original, Quit [E]:
```

Type in **S** to store your input, type **E** to change the name again, or type in **R** to use the old name. Acknowledge your input by pressing **ENTER**.

3. Your NVR System server can store several network configurations which can be activated by the administration tool. Therefore you have to assign a name to your current configuration:

```
Configuration name [Default configuration]:
```

Press **ENTER** to accept the name for Default configuration.
If you need more configurations you can define them later with the administration tool.

4. Now please type in IP address, network mask, default gateway, name server, time server, mail server and your mail domain name:

```
Network IP address [192.168.100.100]:
```

Press **ENTER** if you are accepting this default IP address or type in your desired IP address and press **ENTER** to acknowledge your input. Next you are asked for your netmask:

```
Netmask [255.255.255.0]:
```

Press **ENTER** if you are accepting this default netmask 255.255.255.0 or type in your desired netmask and press **ENTER** to acknowledge your input. Screen display:

```
Default gateway [127.0.0.1]:
```

Press **ENTER** if you are accepting this default gateway or type in your desired default gateway and press **ENTER** to acknowledge your input.

Caution: You must enter an IP address that is reachable from your server. If you enter an address that is not reachable, the performance of the NVR System server may drop dramatically because of network timeouts. If you do not want to use a Default gateway, then enter 127.0.0.1 which is the localhost representation of the server itself.

Next you are asked for the IP address of the nameserver. If you do not need name resolution because you use only IP addresses and no names, you can accept the default suggestion:

```
Nameserver (DNS) IP address [127.0.0.1]:
```

Press **ENTER** if you are accepting this name server IP address (which is the local host) or type in your desired name server IP address and press **ENTER** to acknowledge your input. Screen display:

```
Timeserver (NTP) IP address [127.0.0.1]:
```

Press **ENTER** if you have no available ntp time server and just take the local host or type in your desired timeserver IP address. You can refer to http://www.pool.ntp.org for a list of available ntp time servers for your region. Choose one of the servers and enter its IP address here (we need the IP address and not its name).
Screen display:

```
Mailserver (SMTP) IP address [127.0.0.1]:
```

Press **ENTER** if you are accepting this mail server IP address (which is the local host) or type in your desired mail server IP address and press **ENTER** to acknowledge your input. Screen display:

```
Maildomain (usually the same as your domain name) [yourcompany.com]:
```

Press **ENTER** if you are accepting this mail domain yourcompany.com or type in your desired mail domain and press **ENTER** to acknowledge your input.

5. Now you will be asked to accept your network configuration:

```
Save values, Edit again, Revert to original, Quit [E]:
```

Type in **S** to store your input, type **E** to change the name again, or type in **R** to use the old name. Acknowledge your input by pressing **ENTER**.

Now the script will install NVR System on your system.

Note: You can cancel the installation at any time by simultaneously pressing Ctrl-C. Then your computer reboots and asks you again whether you want to launch the post-installation procedure. A positive response tells the script that an incomplete installation has occurred, and the screen displays the following:

```
Clean up previous installation? [no]:
```

Simply press **ENTER** to accept the default no. If you enter **yes** followed by **ENTER**, the script deletes all configuration data from the previous installation and starts the procedure anew.

During the remainder of the installation of NVR System, the screen displays numerous information messages; however, there are few further prompts for your input.

If the installation should fail for any reason, please make a note of the error message and send this to your Thecus distribution partner.

3.2.3 NVR System server settings

1. On each host NVR System should know the e-mail address of the system administrator in order to be able to send system information. Enter the corresponding e-mail address here. If you do not want e-mail notification concerning the system status, simply press the **ENTER** without providing an address:

```
Enter e-mail address of system administrator []:
```

   If you do not want email delivery of system messages please press **ENTER**. We recommend you to use email and therefore to provide an email address of your system administrator. Acknowledge your input by pressing **ENTER**.

2. The next part of the installation will ask you for certain customer data that are needed for licensing NVR System:

```
Name of customer []:
```

   Type in the name of the customer and confirm your input by pressing **ENTER**. Please note that you can change the name of customer again in the license dialog before you request the license. Next you will be asked for a short form of the customer name:

```
Short (one word) name of customer []:
```

   Type in a short name for the customer and confirm your input by pressing **ENTER**. Screen display:

```
Customer’s address []:
```

   Type in the customer’s address and confirm your input by pressing **ENTER**. Screen display:

```
Enter (one word) name of your organization []:
```

   Type in the name of your organization and confirm your input by pressing **ENTER**. The name you entered will be stored as “Netavis at short_name_of_customer” in the database and used by the NVR System email server as the long name of the sender when an email is sent.

3. Now you will be asked whether you want to automatically start the client GUI on this server's console (for client on server installations):

```
Do you want the client to start automatically [N]:
```

   If you do not have a client on server installation you can just press **ENTER** to not start the client automatically.

   If you want the client to start automatically, enter **y** and then press **ENTER**. You are now asked to set the screen resolution (please refer to *9.19 [19] Client on server screen resolution* on page 43 for details). You can also configure the client starting later on via the admin command line interface (see *9 System administration via command line interface* on page 33).

4. After successful installation you will see the following screen display:

```
NETAVIS installation finished successfully.
After rebooting you may access:

The administration interfaces at http://IP-address-of-server:8000/

The NETAVIS application at http://IP-address-of-server
```

```
Press Enter to reboot the system
```

If the installation failed, you will see the following message:

```
NETAVIS configuration FAILED
You may restart configuring NETAVIS after rebooting

Press Enter to reboot the system
```

5. Press **ENTER** to restart the server and save all changes. NVR System is now ready to use.

3.3 Later configuration changes

Many administration tasks can be handled in the NVR System client application (see *Thecus NVR System 3.4 User Manual*). Changes in IP addresses and upgrading the NVR System application can be handled either directly via the console (*9 System administration via command line interface* on page 33) or using the Web configuration interface (*10 System administration via Webmin* on page 47).

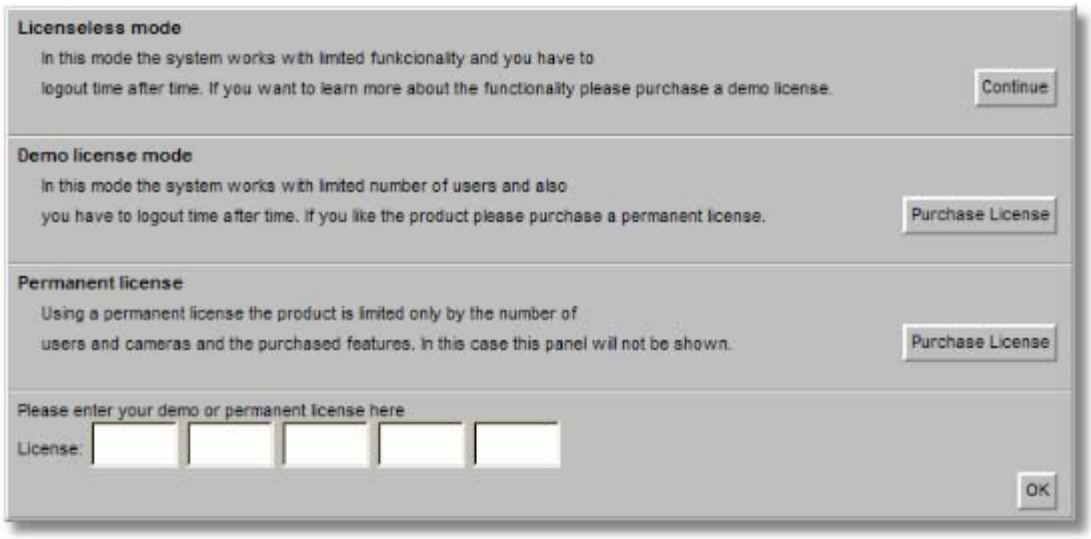
4 Licensing

You have two different ways of managing licenses for your NVR System servers:

1. **Local server licensing**: If you have only 1 NVR System server, then this is the option to choose for you. The server is licensed directly by obtaining a license key. This option also is suitable for small networks of interconnected NVR System servers.
2. **Floating network camera licensing**: This is the option to choose for a larger network of interconnected NVR System servers. The advantage of a floating network license is that one only needs to license the overall number of cameras in the network and is then completely flexible to distribute cameras between the servers. Cameras can be shifted easily between servers without relicensing. Also the initial setup and the later license management of such a server network becomes a lot easier.
   The license key is obtained for the master license server, typically the NVR System user server (NUS), which then offers its camera licenses to the slave servers, usually the NVR System camera servers (NCS). Further details are described below.

   License registration occurs on the first start of a client on the NVR System server and enables all functions of your NVR System system. The data you enter and the derived license key are handled with utmost privacy. No information is transferred from your server to the outside.

   When you connect and login with the NVR System client to a newly installed and yet unlicensed NVR System server, the following dialog appears (you also can obtain a similar license dialog by later on choosing New License in the menu in the lower right corner of the main window):


Licenseless mode
In this mode the system works with limited funkcionality and you have to
logout time after time. If you want to learn more about the functionality please purchase a demo license.
Continue
Demo license mode
In this mode the system works with limited number of users and also
you have to logout time after time. If you like the product please purchase a permanent license.
Purchase License
Permanent license
Using a permanent license the product is limited only by the number of
users and cameras and the purchased features. In this case this panel will not be shown.
Purchase License
Please enter your demo or permanent license here
License:
OK

4.1 Basic algorithm of NVR System licensing

Here is how the NVR System licensing works:

There is a local license key on your server:

- remote licensing is off: both camera# and user# is taken from the license key
- remote licensing is on: camera# is checked out from remote host, user# is used from local license key

There is no local license key on your server:

- remote licensing is off: license-less – you have to obtain a license (permanent, demo, etc.)

- remote licensing is on: camera# is checked out from licensing master server, user# is set to 1 (one) and an additional (one) admin login is possible

4.1.1 How floating licensing works

A license slave (typically a Thecus NVR System camera server, a NCS) connects to the license master (typically a Thecus NVR System user server, a NUS) and checks out licenses for the needed number of cameras. When the master server is not reachable, the slave server still continues to operate for 1 week (7 days) if the first connection was successful. During this period, a system alert event is generated once a day indicating that there is no connection to the license server. In such a case also the license string turns red in the slave's **Admin > System information** dialog that shows the status of the servers. After the 1 week period of no connection to the license server, the license slave stops to operate (the NVR System processes are stopped and no operation is possible).

In such a situation you basically have 2 choices: You can either make sure that the licensing server is reachable or you can switch off the remote licensing and enter a valid license key. For that you have to manually restart the NVR System server application via the command line interface (see *9.2 [2] Start video system processes* on page 33), connect with a client and apply the changes quickly, because the server will stop the NVR System processes after a short period of time.

Each NVR System server licensing slave that obtains camera licenses from a remote license master automatically has a license for 1 user, even if there are no explicit users licensed. In addition to that, one administrator user can always log in.

4.2 License modes: license-less, demo, and permanent

4.2.1 License-less mode

This mode allows you to use the NVR System system with **one user and one camera for 15 minutes**. When you click on **Continue** button, you move directly to the login window. After 15 minutes, you have to log in to the NVR System system again.

4.2.2 Demo mode

A demo-license key assigned by Thecus Technology Corporation allows you to test and use the NVR System system in demo license mode with the basic package with up to **five users and up to 20 cameras** for a defined period with no other restrictions. Per server only one demo license is possible.

4.2.3 Permanent license

After you have entered your full-license key, this mode allows you to use the NVR System system **without restrictions**.

The maximum number of users and cameras is restricted only by the number of user and camera licenses that you have purchased.

4.3 Setting up floating camera licensing

Obtaining and entering license data for a floating network license is exactly the same as for a single server license. The difference is that for a floating network license you sum up all needed camera licenses of all connected slave camera servers (NCS) and then obtain a license for that number and enter it on the master license server (usually the user server or NUS). The number of users is also licensed.

Here is how you can setup a master and several slave license servers:

First, you have to decide which server is to be the master license server. As indicated above, usually a user server (NUS) is best for that purpose.

Sum up all needed camera and user licenses and with this information license your network by obtaining and entering a license key on the master license server. Please refer to *4.4 Obtaining and entering license data* on page 19 for details.

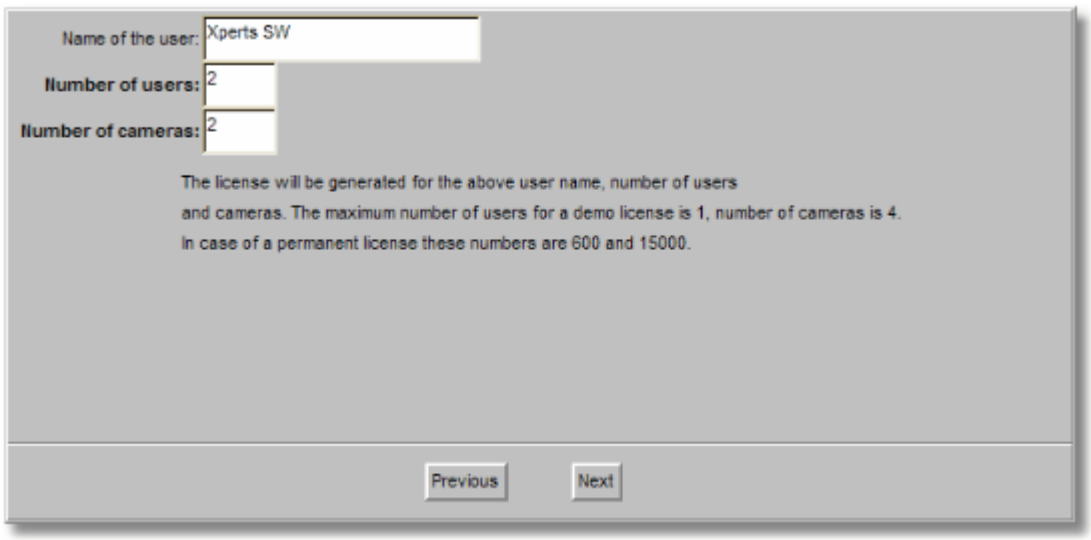
Then you need to make sure that the master server knows all slave servers and that each slave server knows the master server. For newly setup slave servers you can work in licenseless mode and login as admin user, then in **Admin > Host Admin** you can add the master slave server and enable the option **Request license from remote server (=license master)**. As indicated above, repeat that step for all slave servers. Please refer to the *Thecus NVR System 3.4 User Manual* for details on how to do that.

Once you have done that for all slave servers your network is licensed and you can continue to setup cameras and other options.

4.4 Obtaining and entering license data

For obtaining license data you need the number of cameras and users connected to your system.

1. In the **Demo license** or **Permanent license** areas click on the **Purchase License** button. You will see an input mask where you need to enter your license data:


Name of the user:
Xperts SW
Number of users:
2
Number of cameras:
2
The license will be generated for the above user name, number of users
and cameras. The maximum number of users for a demo license is 1, number of cameras is 4.
In case of a permanent license these numbers are 600 and 15000.
Previous
Next

   Enter the designation of your company or organization as user name and then the number of desired users and cameras.

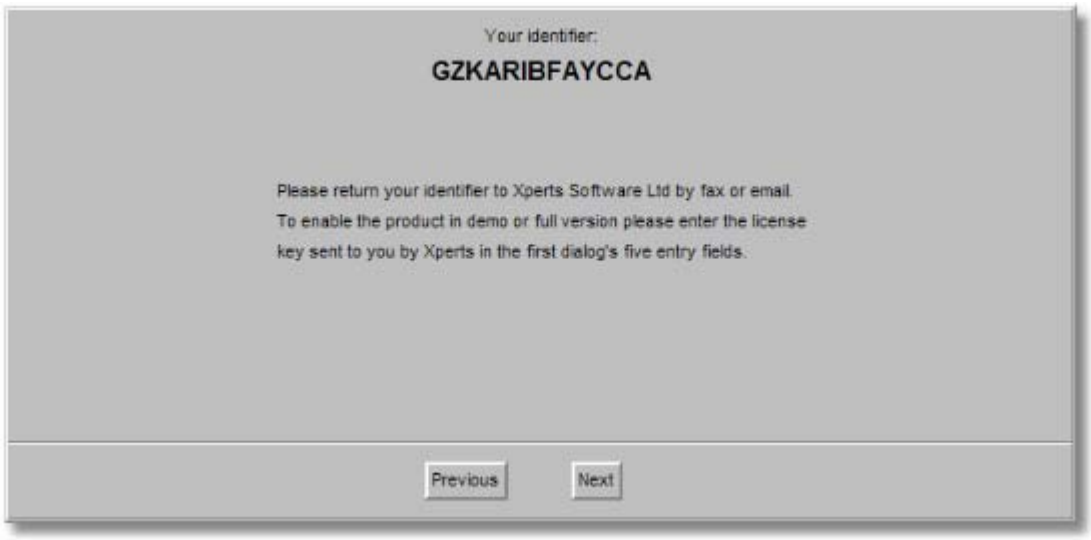
   Please note: For floating network licenses you need to sum up all needed camera and user licenses of all connected servers. You then license the master license server with that summed up numbers. For details on floating network licenses please refer to *4.3 Setting up floating camera licensing* on page 18.

   Confirm by clicking the **Next** button.

2. If you select **Permanent license**, the subsequent dialog offers you to choose between various editions with or without limitations in functionality.

   Note: After initial licensing, the number of user and camera licenses can be extended as needed at any time from the NVR System client via **New License** in the menu in the lower right corner of the main window.

3. Confirm your choice of license type by clicking the **Next** button which will display an ID that is computed from your input and various data you provided during installation:


Your identifier:
GZKARIBFAYCCA
Please return your identifier to Xperts Software Ltd by fax or email.
To enable the product in demo or full version please enter the license
key sent to you by Xperts in the first dialog's five entry fields.
Previous
Next

4. Fill out the standard Thecus order form (available from the Partner area on www.netavis.net). Send the filled out order form to your Thecus solution partner or to Thecus Technology Corporation directly via fax +886 (2) 2698 9098 or e-mail order@thecus.com (e-mail is preferred). You will then receive your license key by fax or e-mail respectively.
5. When you receive your license key, you can continue with license registration by clicking the **Next** button and entering the key in the **License** field. Click the **OK** button.

   If you enter a valid license key, the message „The license key has been saved on the server.“ is displayed at the bottom of the license dialog.

   Your NVR System system is now licensed and ready to use. The User Manual provides instructions.

5 Upgrading NVR System

NVR System is continually developed and enhanced and new releases are published regularly. Also bug-fix releases are published. Therefore it might be possible that you want to upgrade to a newer release than the one actually installed.

First make sure that you want to upgrade to the new release by reading the Release Notes of the new release. You can find the release notes either on the installation DVD-ROM or on the homepage of Thecus (see also *1.2 What is new with this release* on page 5).

In contrast to an installation from scratch an upgrade preserves all archive image data and also configuration data (cameras, users, etc.) of your NVR System installation.

We distinguish between a “small upgrades” and a “big upgrades”:

- A “**small upgrade**” upgrades the NVR System application code and related programs but does not upgrade/replace the underlying operating system or system components. For example, an upgrade from 1.8.0 to 1.8.2 is a small upgrade.

  A small upgrade can be executed from various upgrade sources like network resource, http or DVD-ROM drive and can also be done via secure shell from a remote machine.

- A “**big upgrade**” upgrades everything, also the underlying operating system. Upgrading from release 1.9 to release 3.4, for example, is a big upgrade.

  A big upgrade can only be executed from the server console and a DVD-ROM drive needs to be connected directly to the server.

The following table shows from which upgrades are possible and which upgrades are small or big:

	To release (always newest)			
From release	**1.8.x**	**1.9.x**	**1.11.x**	**3.x**
1.4.x	big	big	(impossible) upgrade to 1.9 first	(impossible) upgrade to 1.9 first
1.5.x	big	big	(impossible) upgrade to 1.9 first	(impossible) upgrade to 1.9 first
1.6.x	big	big	(impossible) upgrade to 1.9 first	(impossible) upgrade to 1.9 first
1.7.x	big	big	(impossible) upgrade to 1.9 first	(impossible) upgrade to 1.9 first
1.8.0 to 1.8.6	small	big	(impossible) upgrade to 1.9 first	(impossible) upgrade to 1.9 first
1.8.7 to 1.8.x	small	small	(impossible) upgrade to 1.9 first	(impossible) upgrade to 1.9 first
1.9.x	-	small	big	big
1.11 to 1.13	-	-	-	big
3.x	-	-	-	small

Caution: If you upgrade from 1.x to 3.0 or higher, you need a new license string. Without a new license string NVR System will not work!

5.1 Performing a “big upgrade” (e.g. from 1.9.x to 3.4)

This upgrade must be started from the server console and a DVD-ROM drive must be connected directly to the server.

If you have installed a release lower than 1.4.x then you first have to upgrade to 1.4.x and then you can upgrade to the newest release.

Make sure that in the BIOS of your computer the boot sequence allows booting from the DVD-ROM drive before booting from hard disk.

Please follow these steps:

1. At the server console log into the admin menu. Please refer to *9 System administration via command line interface* on page 33 or details on how to do that.

   Note: You must login via the server console. An ssh or webmin connection will break because the upgrade will reboot your machine.

2. Choose **[5] Configure upgrade parameters**. Select the upgrade via DVD-ROM and set automatic upgrade to 1.
3. Choose **[5a] Upgrade this server**. Now the upgrade procedure will check whether and how your system can be upgraded. The screen output will inform you about how you can upgrade.
4. Please be very careful to note down the upgrade command that has to be executed after reboot. Place the NVR System 3.4 DVD-ROM in the DVD-ROM drive and press Enter to reboot the system. If the DVD-ROM drive is opened, close it. Now the server will be booted from DVD-ROM drive.
5. At boot from DVD-ROM drive enter the upgrade command just as the upgrade script told you (either upgrade without any option for standard upgrade, or upgrade noraid, or upgrade part for manual partitioning).

   If you do an upgrade part, select **Disk Druid** when you will be asked for partitioning. Be sure to leave the partition table unchanged and mount all partitions the same way they were defined originally (you can see the mount points of the partitions in their name fields).
   Select the file system option leave unchanged - which means don’t format this partitions - on partitions /netavis, /var/lib/mysql and /Images/Images[n].
   Enable the /boot and / (root) partitions to be formatted.

   Caution: DO NOT FORMAT /netavis, /var/lib/mysql and /Images/Images[n] otherwise your data will be lost! On the other hand you MUST FORMAT the /boot and / (root) partitions.
   The partition program Disk Druid may suggest you to format all partitions, DO NOT DO IT!

   Please refer to *3.1 Installation from scratch* on page 9 for more information on manual partitioning.

6. For all the other options you can continue as with the normal installation (please refer to *3.1 Installation from scratch* on page 9).
7. For finalizing the upgrade you have to login once again as user admin with the same password the user had before the upgrade and select **[0] Finalize installation**.
   Now all the configuration data will be restored and you will be asked once more to reboot the server.
8. After reboot the server has been upgraded and you can connect with NVR System clients again.

Please note: After a big upgrade you have to configure the basic network settings again, also the root password changes. Please refer to *3.2 Finalizing the installation and basic settings* on page 12 for the steps you have to execute again.
All NVR System data (images, camera and user configuration) remain intact during the upgrade.

5.2 Performing a “small upgrade” (e.g. from 3.4.0 to 3.4.2)

There are several ways for upgrading NVR System to the newest release:

- Directly from NVR System installation DVD in the locally connected DVD-ROM drive
- Via LAN from an MS Windows computer with a shared DVD-ROM drive and the NVR System installation DVD-ROM loaded, or a shared folder with the contents of the installation DVD
- Via the web from an HTTP server and containing the contents of the NVR System installation DVD

The upgrade can be executed by 2 different options:

- the command line interface of the NVR System server (*9 System administration via command line interface* on page 33), or
- the Webmin interface (*10 System administration via Webmin* on page 47)

For details about the upgrading parameters and process please refer to section *9.5 [5] Configure upgrade parameters* on page 34.

5.3 Performing a distributed upgrade

When there are several NVR System servers in a network, then upgrading servers one by one can be a very cumbersome and time-consuming task. In order to ease this task NVR System offers an automatic distributed upgrade of all interconnected servers in a network.

A network of interconnected NVR System servers can be thought of as a star topology, where the center is the master server which coordinates the upgrade on itself and on each of the servers on the network (slaves).
The operating system processes responsible for the distributed upgrade are running independent of the NVR System application processes and are started at boot time of the server. Starting or stopping NVR System on a server does not affect the run status of the upgrade processes.

5.3.1 Configuring the servers for distributed upgrade

Assuming that the network of interconnected NVR System servers is already set up and the various servers are known to each other, you can configure the servers for distributed upgrades. For details about how to make the servers known to each other please refer to the *Thecus NVR System 3.4 User Manual*.

In a typical NVR System server network, there are Thecus NVR System user servers (NUS) that handle users and separate Thecus NVR System camera servers (NCS) that handle the cameras. Typically, NUS do not handle any cameras and NCS do not accept user logins. The number of NUS and NCS depends on the number of allowed users and managed cameras but usually, there are only very few NUS and many NCS.
Therefore, typically the NUS are very good candidates for upgrading masters while the NCS are upgrading slaves.

Configuring the upgrading master server

1. In the NVR System client application connected to the master server, login as **admin** user, and click on the **Admin** button. There choose the **Host** Admin dialog. You will see the list of available servers on the current network (all upgrading slaves should be listed).

2. For each of the remote servers in the list that you would like to upgrade from the current host set the option **Upgrade software on remote server (=upgrade slave)**.

Configuring the upgrading slave servers

1. With the NVR System client application connect to each of the slave servers, login as **admin** user, and click on the **Admin** button. There chose the **Host** Admin dialog. You will see the list of available servers in your current network. The upgrade master server must also be listed. If not, create an entry for the upgrade master (see *Thecus NVR System 3.4 User Manual*).
2. Select the upgrading master and set the option **Accept software upgrades from remote server (=upgrade master)**.
3. Repeat the above steps for each of the upgrading slaves.

5.3.2 Executing an automatic distributed upgrade

The actual upgrade process is started from the admin user environment.
The upgrade can be executed by 2 different options:

- the command line interface of the NVR System server (either via the console or ssh), or
- the Webmin interface (it provides the same functionality as the command line interface but is accessible via HTTP). How to access the Webmin interface is described in *10 System administration via Webmin* on page 47.

For details about setting the upgrading parameters please refer to section *9.5 [5] Configure upgrade parameters* on page 34.

For details about the upgrade itself please refer to *9.5.2 [5b] Distributed upgrade* on page 35.

6 Setting the server date and time

The suggested way for keeping the server date and time accurate is the automatic synchronization with a time server (NTP protocol). The address of a time server can be set during installation and also later on via the admin interface (see *9.9 [9] Edit network settings* on page 39).

However, if you do not have access to a time server from your server, you can also set the date and time manually.

Caution: The following commands only work correctly if you selected the option **System clock uses UTC** and also selected the correct time zone during installation.

The date and time on an NVR System server can be set either

- via the NVR System administration interface or
- in the **BIOS** (please follow the steps in your BIOS manual and make sure that you set the time in UTC / GMT) or

To set the **date** and time via the NVR System administration interface:

1. Connect to server either via an administration interface (see *9 System administration via command line interface* on page 33 or *10 System administration via Webmin* on page 47).
2. Go to *9.16 [16] Set server date and time* on page 41 and follow the steps there.

7 Dealing with broken disks and unbootable servers

7.1 Dealing with a broken disk

This section describes how to handle server hard disk failures. It does not cover the replacement of external network attached storage devices. Usually such devices have their own meanings how to handle hardware failure. In such a case, please follow the descriptions of the external device.

Depending on your hard disk configuration a hard disk failure can have different impacts and you need to do different things in order to repair such a system. Generally, we recommend to have at least 2 disks in a server. This allows for at least a Software RAID which mirrors all except the image data on 2 disks.

When an image disk breaks and this disk is not covered by a Hardware RAID then the image data on this disk are lost. Since NVR System uses fragmented recording across several image disks the implications for the recording archive are not a total loss of the archive but only a reduction of the frame rate of the stored archive.

Please note: The replacement disk can be of different type and size than the original disk. Just make sure that it has enough space for your needs. If you are replacing a disk that contains the NVR System system software and also image storage, please consider that the NVR System system software needs app. 20GB space.

When a system disk breaks the implications also depend on whether the disk is covered by a Software or Hardware RAID.

7.1.1 Servers with at least 2 disks and Software-RAID

If the secondary system disk (not the boot disk) of a Software RAID breaks, then you can follow the steps in *9.24 [24] Configure replaced disk* on page 45.

If the primary system disk (the boot disk) of a Software RAID breaks, then the server will not boot anymore. You have to first configure in the BIOS of the server to boot from the secondary disk of the Software RAID. Then boot and follow the steps in *9.24 [24] Configure replaced disk* on page 45.

If the disk also contained image data, then a part of the image archive will face a frame rate reduction.

7.1.2 Servers with Hardware RAID

Please follow the instructions for replacing broken disks of the Hardware RAID.

7.1.3 Servers with only 1 disk

We strongly recommend to use at least 2 disks for a server. Then a Software RAID is possible and even a break of a system disk does not mean complete data loss.

However, if you have a 1 disk system, then all your data are lost and you need to setup the complete system from scratch by doing a new installation.

7.2 Repairing an unbootable server

Because of hard disk hardware failures or broken boot partitions sometimes an NVR System server may not boot anymore. If the hardware failure can be solved and the system disk(s) are still working you can follow these steps to repair such a system. You have to boot from the NVR System installation DVD and execute certain commands as indicated below.

However, if a server does not boot anymore because a system disk is broken, then you should refer to *7.1 Dealing with a broken disk* on page 26

Please note: A repair of a server must be done with a NVR System installation DVD of the same version as installed.

The repair function reinstalls the operating system and boot partitions again. It also restore the data of the **mysql** and **netavis** partitions from the netavis backup (the backup that occurs every night on a working server). Any existing **image partitions** (and therefore also the containing image data) **will NOT be erased** but will be kept.

In order to repair an unbootable server, please follow these steps:

1. Place the DVD-ROM in the DVD-ROM drive and boot the system. If the DVD-ROM drive is opened, close it. Now the server will be booted from DVD-ROM drive.
2. At boot prompt enter **repair**.
   The next steps are similar to a new installation process. Please follow the instructions on the screen.

8 Backup and restore of server configuration data

8.1 Introduction to server backup and restore

NVR System provides means for backing up and restoring all configuration data of a server.

The backup contains the name of the machine, its IP address, all its users and their passwords, the full NVR System configuration data including camera parameters, user settings, views of users, etc.

Note: The backup does not contain any archived image data.

The backups can be downloaded from the server and saved on a client computer where different archiving is possible (e.g. USB stick, CD-ROM, etc). Names of backups contain information about the machine and time where and when the given backup was created.

Note: A backup can only be restored when the version of the installed NVR System software matches the version of the backup. If the two versions are not the same, you have to upgrade one of the servers. When version mismatch is detected by the restore procedure, the whole operation is canceled.

Creation and restoration of a backup can be initiated via the NVR System **admin** command line or the **webmin** interfaces. Both applications are secured by a password and can only be used by an administrator.

We suggest creating and archiving a new backup whenever you have made bigger changes on a server (e.g. you added cameras or users). Thus you will be able to restore the configuration in case of a failure.

Every new creation of a backup overwrites the previous one, meaning that on any given server one can find only one version of the server's backup. For a restore you are allowed to upload more than one version but as soon as a new backup is created by NVR System, all backups of this machine will be deleted (as the file name contains information about the name of the machine).

You can upload any previously saved backup, even backups from other NVR System servers. Backups from other servers are not deleted and not overwritten automatically.

Please note: On a functioning NVR System server, a system backup is created automatically every night at 2:00 am. The maximum available space for uploaded backups is 5 MB.

8.1.1 Replacing or cloning a server

Backup and restore can also be used to clone a server machine. This feature can be useful when

- a NVR System server fails and you want to quickly replace it with another server (with exactly the same configuration), or
- you want to clone a server's configuration in another server.

Of course you have to create a backup before your server dies. When you upload a backup (created previously on the machine that failed) onto your reserve machine and restore it you can place this newly created machine in place of your broken one. With the restore you „cloned" your reserve machine into the one which went wrong.

Restoration of a backup created on another machine should be done with care, as this machine will have the same settings as the other machine has/had, including its IP address, name. In a network with more interconnected NVR System servers it could happen that the old machine is still on the

network while you are restoring its backup on another machine. This would result in two servers with identical network addresses which would lead to malfunctions.

A further problem could be that you mistakenly restore a backup on a machine which contains vital archived images which could in such a case get lost.

8.1.2 Keeping reserve servers for quickly replacing broken servers

In a larger NVR System installation with several servers it is wise to keep systems backups from each machine of the network. Depending on the number of active servers and requirements for high uptime it can be wise to have one or more machines as reserve servers. The role of these reserve machines is to quickly take over tasks from server which broke down.

On such a reserve server NVR System must be installed and finalized. It is not necessary to install licenses on them but after the finalization a system backup should be made on each of them. After these steps a reserve server is ready for any later exchange for a broken server and can be put away or stored.

In case of a machine failure the reserve could be taken and put in place of the wrong one. The only thing the administrator should do is to restore a backup (made on the machine which went wrong) onto this machine.

On this reserve machine the license key of the other machine will not match – therefore this machine will only be a clone of the original – but you will have seven days for fixing the problem on the original machine or for applying for a new key for the reserve. At the end of a successful repair of the original machine it can be placed back into the network (after disconnecting the reserve). If this machine broke down with disk errors you can still reinstall NVR System on it and restore its own backup. As the license key will be correct, the machine will operate as before the crash.

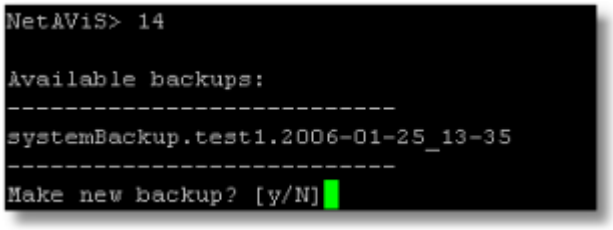
On the reserve machine, however we have to restore its original backup (which was created after the finalization) to turn this machine back into a reserve machine. If you forget about this step then the machine will stay in a „cloned” state and when you upload and restore another system’s backup it will not restart the seven days license period causing that your machine will stop after 10 minutes of work.

8.1.3 Licensing issues

During the restore of a backup created on another server, the license key of the „source” server is also restored. This key will not be valid on this server, but NVR System handles this situation specially. On a „cloned” server you are allowed to run NVR System for seven days. This interval should be enough for you to either get your old server repaired or apply for a new license key for the new server. Of course you should not wait for seven days for applying for a new license key. On the seventh day, when no license has been installed on it, the server will automatically stop after 10 minutes of operation.

8.2 Backup of configuration data

1. Login to the either to the **admin** command line interface (see *9 System administration via command line interface* on page 33) or to **webmin** (see *10 System administration via Webmin* on page 47).
2. Choose the **Create backup** (in the command line interface it is command 14). When you select this item on the command line interface, you get a list of available backups currently stored in the system. The list contains not only the backups created on this machine but uploaded backups as well (created on the other servers and then uploaded to this server).



The name of each file contains the name of the server on which the backup was created and the time of creation. In the above example the name tells that the file is a system backup created on a machine named **test1** on the 25th of January 2006, in the afternoon at 13:35. On a fully functioning NVR System server a system backup is automatically created every night at 2:00 am.

3. The program then asks you whether it should create a new backup. Based on the list you can decide whether you need a new one or the currently available is sufficient. After answering with y the program starts creating the new backup file, which will appear in the list generated at the end of the process. You will see that only one backup will exist for this machine containing the current time in its name.

Important! Do not create a backup on a machine with damaged database because the backup will contain all the errors in the database and can not be used later for successful restoration.

4. If you want to download the just created backup, please refer to *8.3 Up- and download of backups* on page 30 below.

8.3 Up- and download of backups

You can download backups from a server, so you can save them on external media for later use, for example.

Download or upload of a system backups can be done via the standard NVR System web interface.

Download of backups

On the standard NVR System web interface, click on **Start Customizer**. After logging in as administrator, click on the **Download configuration files** link. At the very end of the list you find the system backup files. Clicking on them with the right mouse you can download any of them onto your client machine for further archiving.

Upload of backups

For uploading a system backup file from your client machine you can also use the **Customizer** dialog. Clicking on the **Browse** button allows you to select a file from the file system of your client machine. After clicking on the **Upload** button the file will be transferred to your NVR System server. Now you can access the uploaded file in a restore operation.

Note: You can upload only two kinds of files here, configuration files and system backups.

8.4 Restore of configuration data backups

A previously created (uploaded) backup can be restored.

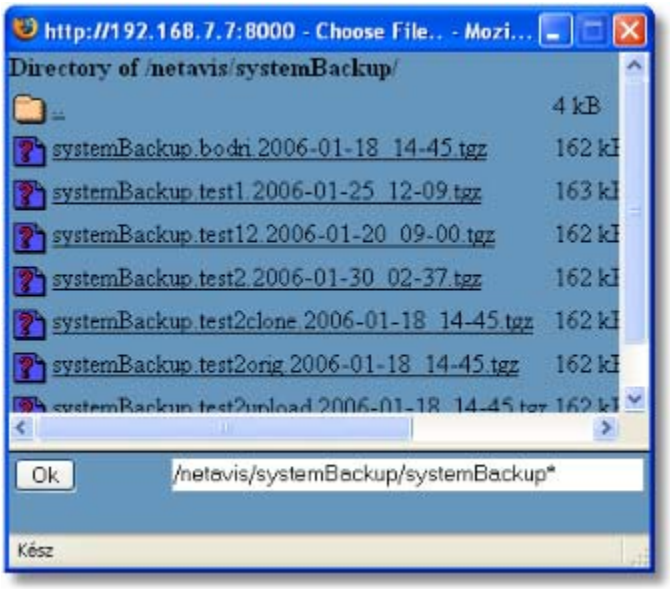
1. Login to the either to the **admin** command line interface (see *9 System administration via command line interface* on page 33) or to **webmin** (see *10 System administration via Webmin* on page 47).
2. Choose the **Restore backup** (in the command line interface it is command 15).
   In the command line interface you will receive a list of all available backups to restore:

```
NetAViS> 15

Available backups:
--------------------------
[0] systemBackup.bodri.2006-01-18_14-45
[1] systemBackup.test1.2006-01-25_12-09
[2] systemBackup.test12.2006-01-20_09-00
[3] systemBackup.test2.2006-01-30_02-37
[4] systemBackup.test2clone.2006-01-18_14-45
[5] systemBackup.test2orig.2006-01-18_14-45
[6] systemBackup.test2upload.2006-01-18_14-45
--------------------------

Select backup to restore, or q to quit:
```

In **webmin** you will be prompted to enter the name of the backup file. By pressing the … button you can also receive a list of backups to choose from:



3. Choose one of the files or cancel the operation.

   Command line interface: After selecting a file by entering its number you are asked whether you really want to restore the selected file. This is the last point where you can change your mind. After answering to this question with **y** the program starts the restoration process.

   Caution: During the restoration the previous setting of the given machine will be lost forever. If you want to return to this setup please create a backup before starting the restore another one. In other words, if you restore a backup on your machine from a few days back then all modifications which were done during this period of time will be lost.

4. If the restored backup is from another server then the license will only run for seven days (see *8.1.3 Licensing issues* on page 29 above). Now you have to decide whether this server now serves as a intermediate reserve for a broken server (and you can live with the seven days) or the server is here to stay longer (then you have to request a new license for this server.

8.4.1 Possible messages during the restore process

During the restoration process various messages may appear:

```
This is not a valid backup file, nothing happen!
```

The message indicates that the selected file does not contain a valid backup or its content is broken. Such files will not be restored.

```
The backup is from this server, the original license is restored.
```

Tells that the backup was done on this machine, its license key will match and it can be used without any licensing limitations.

```
This server already has a cloned license, the license expiration will remain.
Obtain a new license.
```

This message appears when the machine on which you are doing the restore is already cloned, the file you are about to restore was created on another machine and its license key is invalid. In such a case the start of the seven day time limitation will not change.

```
The backup is from another server, the licence will expire within 7 days!
```

This message appears when you restore a backup from another machine and the operation time of this new machine is limited to a seven day period. You have to obtain a new license if you want to use this configuration for more than 7 days.

```
Unlicensed backup, the system will run in licenceless mode only!
```

The backup you are about to restore does not contain a valid license key and you machine will operate in license-less mode.

```
Error, cannot restore the selected backup!
```

This message tells that an error has happened during the restore. This message is followed by another one describing the cause. Such a situation can be for example when the backup file was created on a machine which version does not match with the one on this machine. In such an error situation the backup will not be restored.

```
The IP address of this machine will be changed from <myIP> to <newIP>, please
reconnect to the new address.
Please press [Enter] to continue!
```

This warning message informs you that the IP address of the machine will change during the restore and all your current network connections will disappear (e.g. ssh, webmin, active NVR System clients). To reconnect you have to use the new IP address. The program waits until you acknowledge it by hitting **the Enter** key.

9 System administration via command line interface

For the administration of the server, NVR System provides a command-line Administration menu that can be accessed

- directly at the console login of the server or
- via a network SSH (secure shell) connection.

Please note: For Windows computers an SSH client is available, for example, with the program PUTTY that is freely available from many download servers.

To access the administration menu either at the console or via SSH, log on to the NVR System server as user **admin** with your password or remotely via an SSH client (if you lost your admin password refer to *9.13.1 Lost admin password* on page 41*9.13.1 Lost admin password* on page 41).

After a successful login, you will see the administration menu.

The following subsections explain each of the menu items of the NVR System administration menu.

9.1 [1] View video system status

You can query the status of the NVR System server via menu item **[1] View video system status**.

Type **1** and confirm by pressing **ENTER**.

When the NVR System server processes are running properly you will receive:

```
NETAVIS is running
```

When the NVR System server processes are not running you get this message:

```
NETAVIS service is not running
```

When the NVR System server processes are in an unknown state you receive:

```
NETAVIS is in unknown state
```

In such a case please choose *9.3 [3] Stop video system processes* on page 34 and after the status check choose *9.2 [2] Start video system processes* on page 33 again.

9.2 [2] Start video system processes

Normally the NVR System server processes are started automatically when the server is started. If server processes were terminated, you can start the NVR System server processes manually.

In the administration menu, type **2** and confirm by pressing **ENTER**.

On startup of the NVR System server application, first the image database index is checked and a corresponding message is displayed.

Then the individual server processes are started. Successful startup of these processes is confirmed with the message “Site service was started successfully”. Then the web server is started.

9.3 [3] Stop video system processes

To manually stop the NVR System server application, in the administration menu, type 3 and confirm by pressing **ENTER**.

First, all NVR System server processes are sent the command to properly shut down (signal HANGUP); then the server processes are terminated (signal STOP).

Note that after the server processes are stopped, all active users can no longer access NVR System and live broadcasts are interrupted. A reconnect occurs after a restart.

9.4 [4] Reset image disks to normal state

After a write error on a hard disk partition during image recording, and after such an error has been corrected (e.g. replacement of the hard disk drive) and repartitioning, the error state has to be reset.

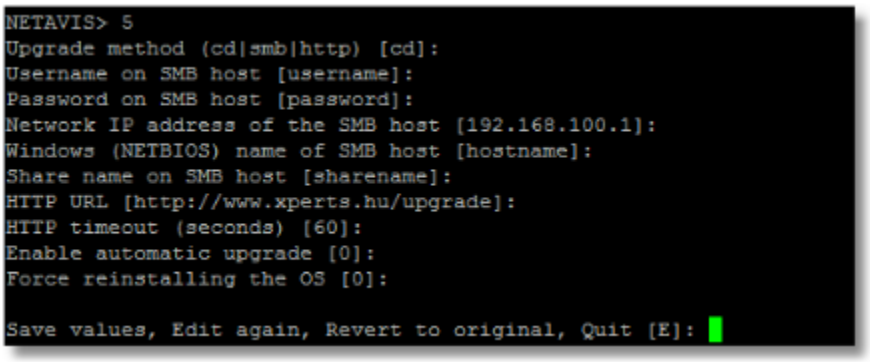
In the administration menu, type **4** and confirm by pressing **ENTER**.

9.5 [5] Configure upgrade parameters

Please note: Before you continue here please read *5 Upgrading NVR System* on page 21 first.

The NVR System administration menu provides you several options for upgrading your NVR System server application to the newest release. In menu item 5 you need to specify parameters for how you want to conduct your upgrade. (The actual upgrade is conducted with menu item 5a.)

1. In the administration menu enter **5** and confirm your choice by pressing **ENTER**.


NETAVIS> 5
Upgrade method (cd|smb|http) [cd]:
Username on SMB host [username]:
Password on SMB host [password]:
Network IP address of the SMB host [192.168.100.1]:
Windows (NETBIOS) name of SMB host [hostname]:
Share name on SMB host [sharename]:
HTTP URL [http://www.xperts.hu/upgrade]:
HTTP timeout (seconds) [60]:
Enable automatic upgrade [0]:
Force reinstalling the OS [0]:
Save values, Edit again, Revert to original, Quit [E]:

2. For **Upgrade method** choose one and press **Enter**:
   - **cd:** Directly from NVR System installation DVD in the locally connected DVD-ROM drive.
   - **smb:** Via LAN from an MS Windows computer with a shared DVD-ROM drive and the NVR System installation DVD-ROM loaded, or a shared folder with the contents of the installation DVD.

     To upgrade on a LAN using SMB (a file sharing protocol compatible with MS Windows), you need to enter the following data:

     - **User name on upgrade host**: the name of the user with whom the Windows directory has been shared
     - **Password on upgrade host**: the password for the above user
     - **Network IP address of upgrade host**: the IP address of the Windows computer with the shared directory (e.g., **192.168.7.1**)
     - Windows (NetBIOS) name of upgrade host: the NetBIOS name of the Windows computer with the shared directory (e.g., **hostname**)

- **Share name on upgrade host**: name of shared Windows directory or device (e.g. a DVD drive with share name **G**). Please make sure that the device/directory is shared under that name on the remote Windows host.

- **http:** Via the web from an HTTP server that provides access to the contents of the NVR System installation DVD.

  Please note: Currently the size of the download needed for a small upgrade is approximately 85 MB. During the download, there is no progress information. The **Automatic upgrade** must be set to 1 (see below)!

  To upgrade via HTTP, you need to enter the following data:

  - URL: complete HTTP link to the upgrading server and location of the root of the installation DVD.
  - HTTP timeout: time in seconds after which to terminate an attempted upgrade if there is no connection to the specified HTTP server.

3. **Enable automatic upgrade**: You must set this to **1** to actually enable the execution of the upgrade. If it is set to **0**, an upgrade command would only check whether the version on the upgrade media (DVD-ROM, shared device, or HTTP) is newer than the installed version but no upgrade would be executed.
4. **Force reinstalling the OS** actually is only relevant if you do a *9.5.2 [5b] Distributed upgrade* on page 35. If you do not employ distributed upgrades you can ignore this parameter and leave it at **0** (zero).

   Distributed upgrades do not upgrade the underlying OS (operating system), because the OS can only be upgraded locally. Normally, the update routine of [5a] can automatically decide (based on the version numbers), whether a big upgrade (also upgrade of the OS) is necessary. But if a server that has previously been upgraded via a distributed upgrade this automatic detection does not work anymore. Therefore you can use this option to force a local upgrade of the OS.

   If you enter **1** the script will force the system to upgrade the underlying OS too during the local upgrade ([5a]).
   If a reinstallation of the OS is forced for cases where it would not be necessary, nothing bad will happen; just the upgrade process will take longer.

5. Confirm your entries with **s** (for save) and press **ENTER**. After your data is saved, you will return to the administration menu.

9.5.1 [5a] Upgrade application

To execute the upgrade with the parameters you set under [5], type **5a** and confirm with **ENTER**.

Please note: For more details please see *5 Upgrading NVR System* on page 21.

The update is then executed automatically. On successful completion of the upgrade you will receive a message: Congratulations! Your system was successfully upgraded.

If your HTTP server or SMB directory could not be found or you have the wrong NVR System installation DVD, you will receive a corresponding error message.

9.5.2 [5b] Distributed upgrade

Please refer to *5.3 Performing a distributed upgrade* on page 23 for a general description of a distributed upgrade. Here we just briefly discuss the steps for executing the upgrade.

The upgrade itself is divided into several steps:

1. Copy upgrade kits from an upgrade medium (e.g. a CR-DROM) to the local hard disk of the master server.

2. Distribute all files belonging to the upgrade kit to all upgrade slave servers.
3. Execute the upgrade on all of the servers at the same time.

The first two steps can be restarted any number of times and you can decide not to execute the upgrade after copying and distributing the upgrade kit files. However, after starting the upgrade itself, there is no way to stop it. The upgrading master server starts the upgrading procedure on each slave server and waits for the final status. If any of the servers could not finish the upgrade properly for any reason, all machines in the network will be rolled back to the version prior to the upgrade.

If any of these machines are inaccessible during the upgrade procedure (even temporarily), the whole upgrade will be canceled and rolled back. If you want to upgrade the other servers, disable the remote upgrade option on all inaccessible slave servers, so that the rest of the distributed server network can be upgraded.

When the upgrade has been finished successfully on all servers then the upgrade service will restart as well using the upgraded version. From this point on, the upgrade process is ready for a new upgrade.

Here is a step by step description of the distributed upgrade process:

1. To execute a distributed upgrade with the parameters you set, type **5b** and confirm with **ENTER**. This brings up the following screen:

```
                  VideoSystem distributed upgrade

This procedure will upgrade VideoSystem on this server (master),
and on all distributed servers (slaves) for which the option
'Upgrade software on remote server' has been enabled in
the Host Administration tool of the NVR System client app.

On each remote slave server to be upgraded, the option
'Accept software upgrade from remote server' must be
enabled as well.

If any of these machines are even temporarily inaccessible during
the upgrade procedure, the whole upgrade will be canceled!
If you still want to upgrade the other servers, disable the
'Upgrade software on remote server' option for all inaccessible
servers, so that the rest of the distributed server network can
be upgraded.

NOTE: Once started, the upgrade will continue to work even when
you quit from the upgrade menus or from viewing the log files
(using CTRL-C).
```

   Are the settings in the Host Administration tool on all servers
   conform with the description above? [y]:

2. Check once more that the settings have been done as described above and under *5.3 Performing a distributed upgrade* on page 23.
3. Press **Enter** to continue.
4. If you already copied an upgrade kit to your server, then you can continue here. If not, jump to step **8**.
   You will be informed about the release information of the already loaded upgrade kit. You will also be asked whether you want to use this upgrade package for the distributed upgrades:

```
There is already an upgrade kit with version 1.9.0.112.204 available
on the local hard disk of this server.
Do you want to use this kit for the distributed upgrade? If you enter no, you
will be prompted for a medium containing a new upgrade kit [n]:
```

   Enter **y** if you want to use the existing kit for the upgrade or **n** (or just press **Enter**) for loading a new kit. If you enter **y** to use the existing kit you can continue to step **8**.

5. Now you will be asked about where to load the kit from:

```
The currently selected upgrade media is 'local CD-ROM drive'.
To change the upgrade media, please use menu item [5].
Do you want to change the upgrade media? [n]:
```

   Just press **Enter** if the selected upgrade media is OK.

6. This reads the upgrade media and print the versions of the installed NVR System and of the upgrade kit:

```
Reading the upgrade media, please be patient...
The running version: 1.9.112.204, mounted version: 1.9.0.112.205
Do you want to copy the mounted version to your local hard disk [y]:
```

7. Enter **y** or just press **Enter** if you want to start copying the upgrade kit from the upgrade media to the local hard disk. After copying the upgrade kit to your local hard disk you can remove the upgrade media because it is no longer needed.
8. Now you will see the distributed upgrade menu:

```
Please make your selection:
[f] Distribute files
[s] Start upgrade
[l] Show status
[q] Quit (without action)
netUpgrade>
```

9. Enter **f** to distribute the upgrade kits from your local master server to the upgrading slaves. You will see some control messages like:

```
The following lines are from the upgrade log file.
Viewing will end automatically when the upgrade is done
or you can end viewing by pressing CTRL-C
------------------------------------------------------------------------------
-
2007-04-26 15:49:32,928 - (I) Status of 3 slaves (incl. this server):
2007-04-26 15:49:32,928 - (I)  On 3 server(s) upgrade has been initiated
2007-04-26 15:49:42,934 - (I) Status of 3 slaves (incl. this server):
2007-04-26 15:49:42,934 - (I)  On 3 server(s) version information is being
received
…
2007-04-26 15:50:03,018 - (I)  On 2 server(s) file download is in progress,
please wait!
```

10. After the upgrade kits have been successfully distributed to the slave servers, you will again receive the distributed upgrade menu.
11. Now you can start the actual upgrading process using the distributed kits by entering **s**. You will be asked:

```
Do you want to rollback the whole system on error?
```

    If you answer **yes** then the upgrade will roll-back all severs on an error on any server. It means that all servers will come back to the last working version where the update started from.
    If you answer **no** then the upgrade will continue even if one or more servers cannot be successfully upgraded. After such an upgrade some servers may run on the previous version level of the NVR System, and the rest will work with the new version. In this case the servers with older versions will not be mounted into the distributed system, but they will work standalone without any problem. The operator may directly login to these servers with a normal NVR System client and use the system.

12. Once you answered the rollback question you will see progress messages. Similar to the above ones. You can stop the automatic display of the upgrade log by pressing CTRL-C any time. This will not stop the upgrade process, just the viewing of the log messages.
13. Once the upgrade is finished successfully, you will again receive the distributed upgrade menu. To view the upgrade status enter **I**. This will print a status report of the upgrade, as snapshot of the current situation. The report can be seen on the screen and can also be stored in the file `upgradeLog.txt` on the server. This file can be downloaded from the main start page of NVR System **Start Customizer** and here the section **Download configuration files**.
14. Press **q** to get back to the admin main menu.

9.6 [6] Shut down system

To shut down the NVR System server, enter **6** in the Administration menu and then press **ENTER**.

Please do not simply turn off the NVR System server; instead use this menu item to properly shut down the NVR System application and computer. Proper shutdown avoids data loss and enables faster restart of the NVR System computer because data inconsistencies that might occur due to a brutal power-off do not have to be repaired on startup.

All users who are logged in directly to the NVR System server will receive a system message: `The system is going down for system halt NOW`.

After shutdown, the NVR System server is turned off and must be restarted manually with the power-on button.

9.7 [7] Reboot system

To manually restart the NVR System server application and the NVR System server, enter 7 in the Administration menu and confirm by pressing **ENTER**.

All users who are logged in directly to the NVR System server will receive a system message: `The system is going down for reboot NOW`.

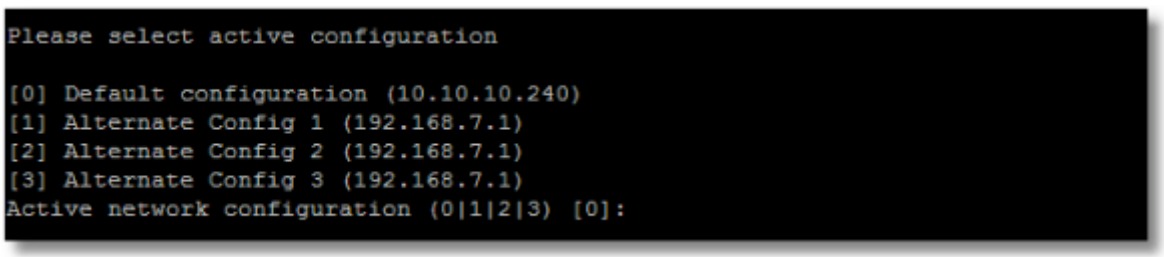
After completed shutdown, the NVR System server is automatically rebooted and the NVR System server application is restarted.

Note: Whether the NVR System server is restarted after power failure depends on its BIOS settings. If you want the NVR System server to restart after a power failure, make the necessary settings in its BIOS; these are usually located under the power management option: Power on after power loss.

9.8 [8] Select active network configuration

The NVR System server allows you to create and save up to four network configurations.

To select the network configuration, type **8** in the Administration menu and confirm by pressing **ENTER**. This gives you a menu for selecting from available network configurations. Select the configuration you want by typing its configuration number and confirm by typing **S** (for Save) and then pressing **ENTER**.


Please select active configuration
[0] Default configuration (10.10.10.240)
[1] Alternate Config 1 (192.168.7.1)
[2] Alternate Config 2 (192.168.7.1)
[3] Alternate Config 3 (192.168.7.1)
Active network configuration (0|1|2|3) [0]:

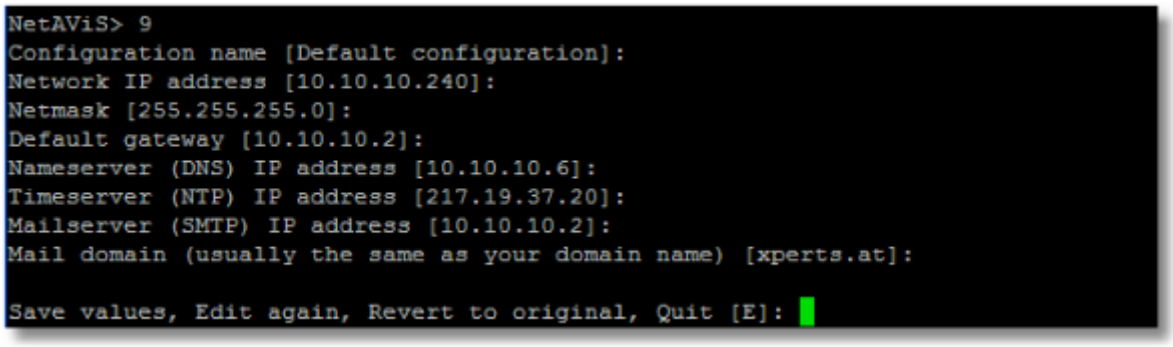
After you confirm your choice of network configuration, the NVR System server application is stopped; then the network interface is restarted with the new configuration parameters; finally, the NVR System server application is restarted.

Note: The IP address of the server is changed in the process. If you are logged in via a network connection (e.g. SSH), you will lose your connection and need to reconnect.

Caution: If your NVR System server also includes an NVR System digitizer server (NDS) for analog video cameras (one or more PCI video grabber cards installed), you will need to adapt the camera settings to the new network settings or the assignment of analog cameras to the new IP address.

9.9 [9] Edit network settings

To change the values of the predefined network configuration, type **9** in the administration menu and confirm by pressing **ENTER**.


NetAViS> 9
Configuration name [Default configuration]:
Network IP address [10.10.10.240]:
Netmask [255.255.255.0]:
Default gateway [10.10.10.2]:
Nameserver (DNS) IP address [10.10.10.6]:
Timeserver (NTP) IP address [217.19.37.20]:
Mailserver (SMTP) IP address [10.10.10.2]:
Mail domain (usually the same as your domain name) [xperts.at]:
Save values, Edit again, Revert to original, Quit [E]:

Then you can make or modify the following settings:

- Configuration name: name of your predefined configuration
- Network IP address: desired IP address of your NVR System server
- Netmask: network mask of your IP network in which the NVR System server is located
- Default gateway: IP address of the standard network interface for IP addresses outside your network
- Name server: IP address of your standard DNS (domain name server)
- Time server: IP address of your standard time server (NTP is supported).
  You can refer to http://www.pool.ntp.org for a list of available ntp servers for your region. Choose one of the servers and enter its IP address here (we need the IP address and not its name).
- Mail server: IP address of your super ordinate mail server
- Mail domain: domain name of your mail server (e.g. xyc.-company.com)

To save your settings, type **S** (for save) and confirm by pressing **ENTER**.

Caution: Make network settings only in collaboration with your network administrator. An unfortunate choice of parameters (e.g. duplicate IP address) can disturb other computers or servers in the network.

9.9.1 [9a] Edit other netcard's settings

Please note: This option is listed only if you have more than 1 network interfaces in your server.

Some installations need servers that can work in more than one network segment. A typical use case would be to have all the IP cameras in one network segment and the clients in another network segment. Also the traffic for NAS and SAN devices could require a separate network segment.

For such cases NVR System can be configured for more than one network interface. This can be done with the menu [9a].

Please make sure that your hardware is set up correctly.

Here are the steps:

1. When you choose the command you will be able to setup the second interface or if you have more than 2 network interfaces installed you get list of the available interfaces. If so, choose the network interface you want to configure.
2. Enter the **IP address** and the **Netmask** for the selected interface.
3. Enter **S** to save your changes and confirm with **Enter**.
4. You can repeat the above steps for each network interface you want to configure.

9.10 [10] Copy CD image

This menu item allows you to create a DVD image from the NVR System Installation DVD. You can use this ISO image with any standard CD/DVD burning software to create a backup copy of the NVR System installation DVD. Type 10 in the Administration menu and confirm with ENTER.

The DVD image of the NVR System installation DVD is copied to the directory /netavis/rpms and named netavis.iso.

9.11 [11] Eject CD

This menu item allows you to eject a DVD-ROM from the DVD drive after copying a DVD image to the hard disk.

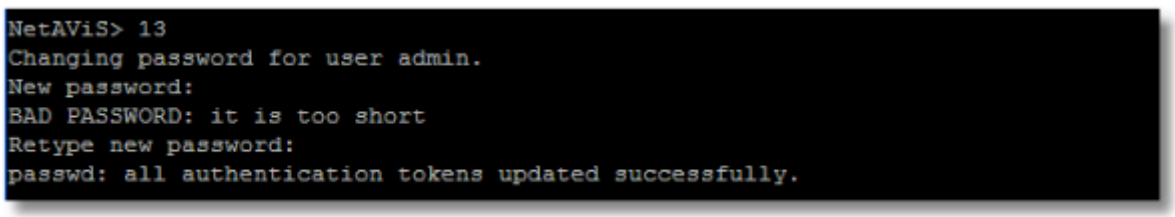
9.12 [12] Show encrypted root password

NVR System uses a different root password for each NVR System server. This menu item allows you see the key for the root password. You need to communicate the password key to NVR System in order to get the root password for your machine.

If you need to login as root user please contact Thecus Technology Corporation with the password key. Do that via the standard ticketing system. You should explain why you need the root password, since you normally loose the warranty for the bundled Setup.

9.13 [13] Change admin pass

This menu item allows you to change your **admin** password.


NetAViS> 13
Changing password for user admin.
New password:
BAD PASSWORD: it is too short
Retype new password:
passwd: all authentication tokens updated successfully.

Type **13** in the Administration menu and confirm with **ENTER**. Then you are called upon to type in your new admin password and once again to retype your new password.

Confirm your input with ENTER.

9.13.1 Lost admin password

If you lost your **admin** password normally you would not be able to access the administration interface of your server. Therefore we provided a special mechanism for fixing this situation. This procedure only works at the server console and does not work via a network login (for security reasons):

1. On the server console login as user **netavis** with password **netavis** which will echo an encrypted password code.
2. Contact the technical support of Thecus at support@thecus.com with this code.
3. You will receive a password for another user **chpass** (a user for changing the password of the **admin** user). Login as **chpass** with the password you received.
4. After login as **chpass** you will be asked for the new password of the **admin** user. Enter the new password for the **admin** user twice. After that you are logged out automatically.
5. Now you can login as **admin** user with the new password that you supplied.

Caution: Please be careful not to forget or lose the **admin** password again :-)

9.14 [14] Create backup

Please refer to *8.2 Backup of configuration data* on page 29.

9.15 [15] Restore backup

Please refer to *8.4 Restore of configuration data backups* on page 30.

9.16 [16] Set server date and time

This menu item allows you to set the server date and time (also the hardware clock will be set to the new date and time settings).

Caution: For setting date and time of the server, all NVR System processes will automatically be stopped and then restarted. During this (short) downtime, no recording is happening and no clients will be able to work.

Type **16** in the Administration menu and confirm with **ENTER**. Yow you are asked whether you would like to change the date and time. Confirm with **yes** or just press **Enter**.

Now all NVR System processes will automatically be stopped and you will be prompted for a new date and time.

Enter the date and time in the requested format and confirm with **ENTER**.

After that the NVR System processes will automatically be started again.

9.17 [17] NAS management

This menu item allows you configure NAS (network attached storage) devices for image storage.

Please Note: Currently NVR System directly supports NFS (network file system) version 3 only. If you want to use other NAS, SAN or network devices that are not directly supported you can manually mount them under Linux and use *9.18 [18] Add manually mounted image storage* on page 43 to add the device for image storage.

When you select this menu item you will get a submenu with the following entries:

```
[s] show NAS devices
[a] add new NAS device
[m] mount NAS device
[d] delete NAS device
[q] Quit without action
```

Here is a description of the available commands:

Command	Description
[s] show NAS devices	With this option you can see the configured NAS devices, their mount points to partitions, and which of them are active.
[a] add new NAS device	With this option you can add a NAS device. 1. Enter **new nfs connection** in the form <host>:<exported path>. 2. Take the default **nfs port**. 3. For **usable size of the device** enter the size you want to use for image storage in MB. If you enter a size that is bigger than the available space on the device, then all the available space will be used. 4. Confirm your inputs with **Enter**. 5. Now the NAS device will be configured and mounted. After that the NVR System processes will be stopped and restarted. **Caution:** The remote NFS NAS directory must have read / write permissions set for all users.
[m] mount NAS device	With this option can you mount NAS devices that have been added but that were subsequently not reachable for a longer period of time and that have been unmounted automatically (see *9.17.1 When a NAS device is unreachable* on page 42). Once the problem is fixed you have to mount the device again with this command in order to reactivate it for image storage. Once the device is successfully mounted again, the NVR System processes will be stopped and restarted.
[d] delete NAS device	With this option you remove an attached NAS device from the server. Nor further image data will be written to the device. After that the NVR System processes will be stopped and restarted. Please note that the actual image data will not be deleted from the device.

9.17.1 When a NAS device is unreachable

When an attached NAS device is not reachable by the NVR System server (after an NFS timeout) events will be generated inside NVR System every minute to inform the administrators about the unreachable device. When the device is not reachable for a longer period of time, it will be unmounted

automatically. This means that no further image data will be stored onto the NAS device.
In such a case you have to fix the problem and mount the device again (see above).

9.18 [18] Add manually mounted image storage

This command lets you add a manually mounted Linux storage device for video image storage. You can use this command for manually configured storage devices that are not directly supported by NVR System. For directly supported NAS devices (currently only NFS) please refer to *9.17 [17] NAS management* on page 41 instead. For adding disks directly to the server please refer to *9.23 [23] Add image storage hard disk* on page 45.

Please also refer to *2.2 Hard disks and storage devices* on page 7 for a description of the general options for adding storage devices.

Please note: To use this menu item, you must have Linux knowledge.

To add a manually mounted image storage follow these steps:

1. At the Linux login as root user.
2. In Linux install the necessary drivers (including optional hardware) for connecting to the storage device.
3. In Linux shell mount the storage device. If you are running a OS-bundled NVR System installation you must mount under the Linux directory `/Images`. In an OS-unbundled installation you can use any mount point.
4. Make sure that the device is automatically mounted at server boot time.
5. Use this menu item [18] to add the image storage.
   You will be asked to enter the name of the new image directory (for bundled installation the relative path name under `/Images`) and the available space in MBytes. The video processes will be restarted after running this command.

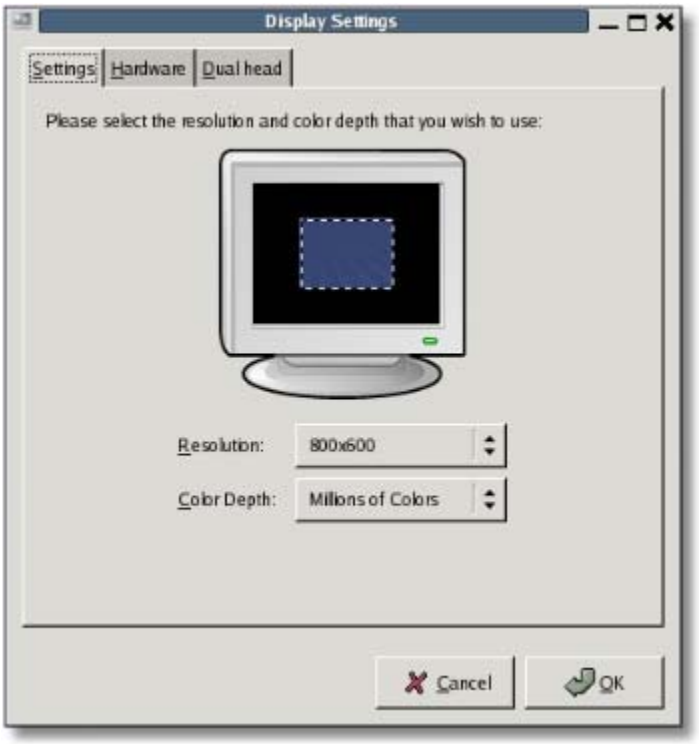
9.19 [19] Client on server screen resolution

This command lets you change the screen resolution for the client on the server console.

Please note: This command can only be run on the console of the server that contains the client directly. It is not appropriate for changing the screen resolution of MS-Windows or browser clients.

Follow these steps to change the client on server screen resolution:

1. If you are running the client GUI, press **CTRL+ALT+F2** on your keyboard to switch to the administration command line interface (see *9.19.1 Switching between administration command line interface and client GUI* on page 44 for details). Otherwise just continue with the next step.
2. Login as **admin**.
3. Select this command **[19]**.
   The command starts the graphical X-Windows environment to set the screen resolution for the client on the server.



4. Switch to the **Hardware** tab and select the correct monitor type and monitor resolution.
5. Go to the **Settings** tab and select the **Resolution** that your monitor can handle.
6. After pushing **OK** the command line admin menu will be appear again.
7. An already running client GUI can be restarted by running *9.21 [21] Client on server restart now* on page 45 in order for the changes to take effect.
   You may also want to run *9.20 [20] Client on server autostart config* on page 44 to automatically restart the client GUI at boot time and every screen resolution change.

If you mistakenly set a wrong screen resolution that your monitor cannot display you can set a lower resolution and use the command *9.21 [21] Client on server restart now* on page 45 to restart the client again.

9.19.1 Switching between administration command line interface and client GUI

You can switch between the administration command line and the NVR System client GUI by simultaneously pressing **CTRL+ALT+F1** or **F2** or **F3** on your keyboard:

- **CTRL+ALT+F2** shows console 2, which is the administration command line interface (where you can login as **admin**).
- **CTRL+ALT+F3** shows console 3, which is client GUI.
- **CTRL+ALT+F1** shows console 1, which is another administration command line interface that usually shows the log output of the running client GUI. If no client GUI is running, this console also shows the admin login. When you login as user **view**, you can manually start the client GUI on console 3.

9.20 [20] Client on server autostart config

The client on server graphical interface (GUI) can start automatically at server boot and at every screen resolution change (see *9.19 [19] Client on server screen resolution* on page 43). This capability can be switching on and off with this command.

When run, this command shows the present autostart setting and asks for changing it.

After switching on the auto start, at exiting from admin menu, the client will start immediately, while switching off the auto start does nothing with the already running client. Only after exiting the client it will not restart automatically again.

When the client autostart is switched off, you can manually start the client GUI on the server by following these steps:

Switch to console 1 (press **CTRL+ALT+F1** on your keyboard) and login as user **view**. Your client will then start on console 3 (press **CTRL+ALT+F3** on your keyboard).

9.21 [21] Client on server restart now

This command can be used to restart the graphical client on server.

It may be useful if a wrong screen resolution has been set and the monitor cannot show the client. In such a case you would correct the screen settings via *9.19 [19] Client on server screen resolution* on page 43 and use this command to restart the client.

9.22 [22] Show network details

This function lists all the network cards/interfaces of the server. The interfaces are shown independent of whether they are configured or not.

The command lists the IP address and the net mask of all interfaces. This may helpful if the server got its IP address from an DHCP server and you want to know its value.

9.23 [23] Add image storage hard disk

If you want to increase the image storage capacity of your server NVR System lets you add additional hard disks to your server. Please also refer to *2.2 Hard disks and storage devices* on page 7 for a description of the general options for adding storage devices.

Please note: This command should be used for adding new hard disks only and should not be used for replaced broken disks. For replacing broken disks refer to *9.24 [24] Configure replaced disk* on page 45. Replace any broken hard disks before adding new ones with this command.

Follow these steps to add a new hard disk for image storage:

1. Power off the server.
2. Install and connect a new hard disk to the server.
3. Boot the server.
4. Run this command **[23]** and follow the screen.
   The command will find a new disk by searching for any device that is not mounted in the file system as image partition. Since this command configures one disk at a time only, run it for each disk added to the server.

9.24 [24] Configure replaced disk

When a hard disk breaks it must be replaced by a new one and configured with this command. You can replace broken system disks and also image disks. Please refer also to *7 Dealing with broken disks and unbootable servers* on page 26 for a general description of the topic.

Please note: The replacement disk can be of different type and size than the original disk. Just make sure that it has enough space for your needs. If you are replacing a disk that contains the NVR System system software and also image storage, please consider that the NVR System system software needs app. 20GB space.

Follow these steps to replace a broken disk:

1. Find out, which disk(s) is/are broken by running the command *9.25 [25] Show unusable disks* on page 46.
2. Power off the server and replace the broken disks by new ones.
3. Boot the server.
4. Run this command **[24]** for each replaced disk.
   This command will partitioning the new disk, make a proper file system on it and in case the broken disk was part of a software RAID, also repair the software RAID data. It will also reset the disks to normal state for full operation (which is equivalent to running *9.4 [4] Reset image disks to normal state* on page 34).

9.25 [25] Show unusable disks

If NVR System is not able to write to a disk after several retries it will mark the disk as unusable. Then the disk will no longer be written to.

In a system with several disks, this command helps you to identify the broken disk(s). It lists all broken disks and shows their device name, the manufacturer, the type of the disk and the serial number.

To replace the disk refer to *7 Dealing with broken disks and unbootable servers* on page 26 and *9.24 [24] Configure replaced disk* on page 45.

9.26 [q] Quit

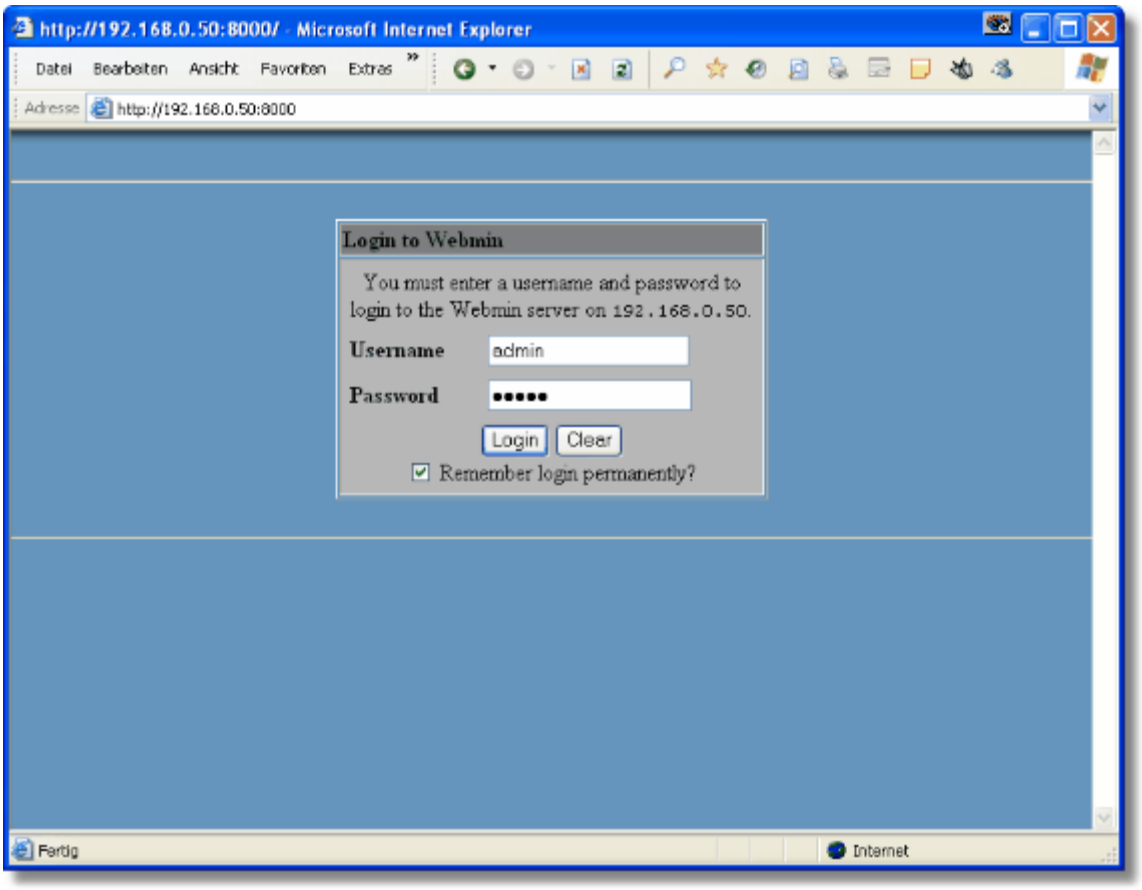
Enter **q** in the Administration menu and confirm with **ENTER** to log out.

10 System administration via Webmin

In addition to administration via console, NVR System also offers an administration interface via Web browser.

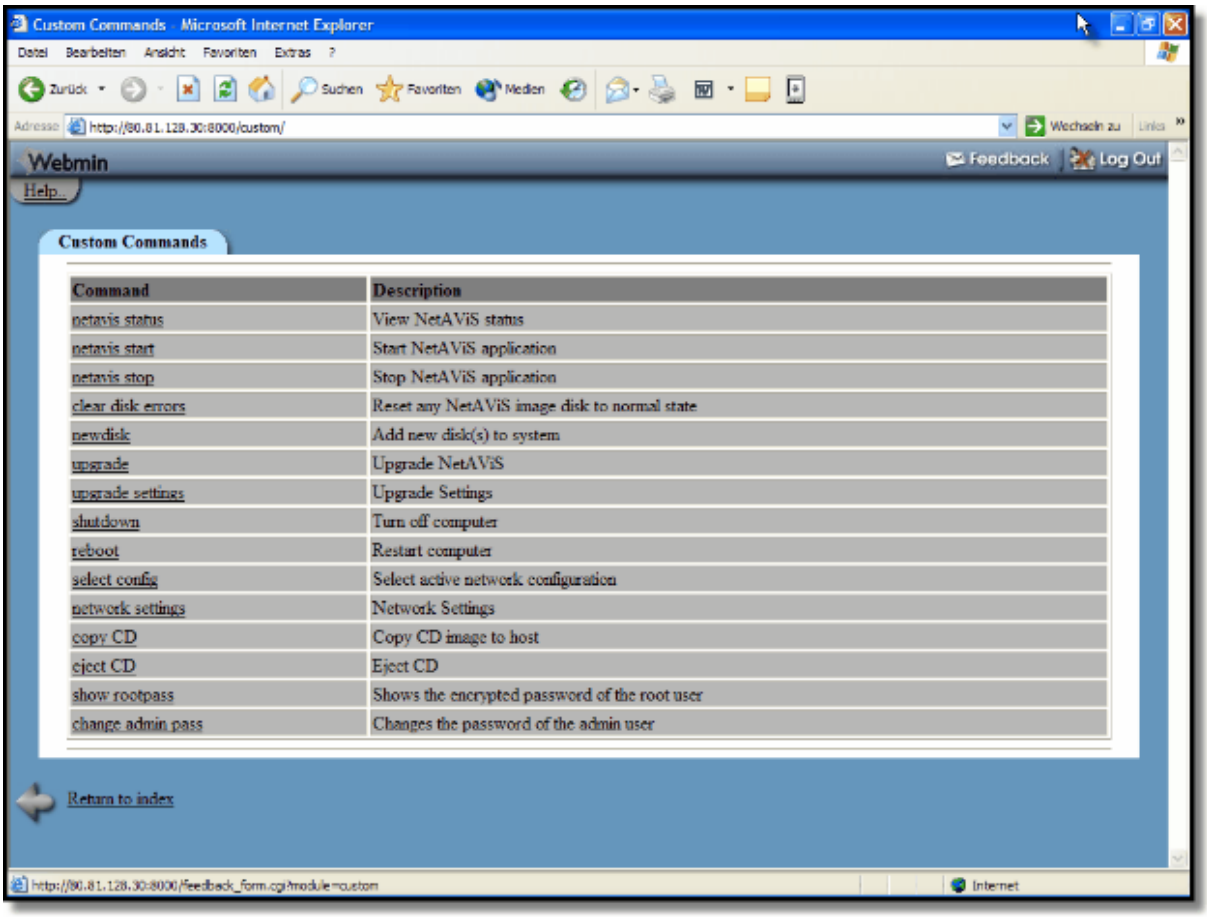
10.1 Webmin login

Enter the URL of your NVR System server with port **8000** and log in on the Webmin login window as user **admin** with your password



10.2 Webmin menu

After you have logged in, you have available the same menu items as with the console interface.



A simple mouse click on the menu item in the Webmin menu displays the respective function; confirmation is requested before the function is executed.

Confirm your choice by clicking on the **Execute** button. Then the respective function is executed and any messages are displayed as in the console Administration menu.

A click on **Return to commands** takes you back to the Webmin administration menu.

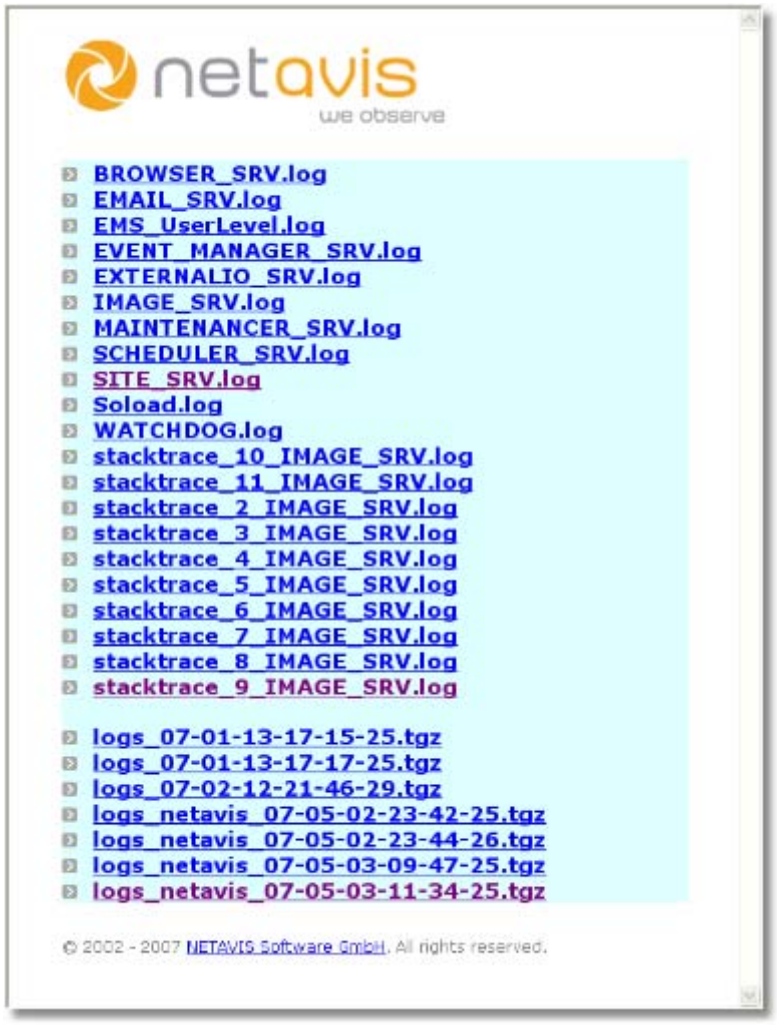
On completion of your administration work, exit the Webmin administration menu via the **Log Out** button at the top right of the screen.

10.3 Obtaining server logs

For debugging purposes, each NVR System server stores log files for various activities. You can access these logs via HTTP at

http://<your-server>/logs.jsp

You will be prompted for the admin user and password. After successful login you receive the logs page:



Here you can access logs and dump files for various purposes.

11 Connecting additional hardware devices

11.1 Connecting an SMS sending device to an NVR System server

NVR System can send SMS messages on events. The supported SMS sending devices are **Siemens TC35i** and **Siemens MC35i**.

11.1.1 Hardware installation (connecting the SMS sending device)

1. Make sure the NVR System server is turned off.
2. Plug in the RS232 connector to com port 1 on the NVR System server.
3. Make sure that the com port in the BIOS of the server is enabled.
4. Make sure the SMS sending device is connected to the mains and switched on.
5. Make sure the SIM card requires no PIN and is inserted in the SMS sending device.
6. Turn on the NVR System server and then turn on the SMS sending device.

11.1.2 Configuring the NVR System server for SMS sending

Initial server setup

To initially configure an NVR System server for the SMS sending device follow these steps:

1. With your browser connect to the NVR System server
2. Select your preferred language and click on **Start Customizer**.
3. Login with name: **admin** (default password: **admin** or your own if you changed it)
4. Click on **Download configuration files**
5. Download the following file to your client:
   common.utils.ExternalIOPluginMappings.default.xml
6. Edit part of the file so that it looks like this:

```
...
<plugin id="4" valid="1">
   <pluginClass>server.externalIO.M35Sms</pluginClass>
   <deviceHandlerClass>server.externalIO.SerialIO</deviceHandlerClass>
   <deviceName>/dev/ttyS0</deviceName>
   <deviceParameters>9600;N;8;1;N</deviceParameters>
</plugin>
...
```

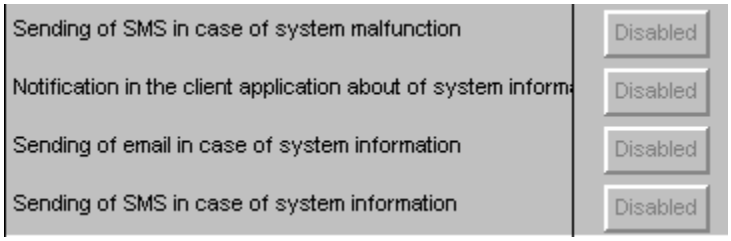
7. Upload the edited XML file back to the server.
8. Restart NVR System (not the whole server) with the **[3] Stop NetAVIS** and **[2] Start NetAVIS** commands of the Admin interface (see *9 System administration via command line interface* on page 33 or *10 System administration via Webmin* on page 47).

Setting SMS numbers and privileges

Now you can define an SMS number for one of the users (e.g. the admin user) and test whether the SMS sending is working. Please refer also to the *Thecus NVR System 3.4 User Manual* for details.

1. Start the NVR System client and login
2. In the **User Admin** tab select the user for whom you want to define SMS settings (e.g. the admin user). In the **Properties** dialog enter a valid telephone number in the **SMS number** field. Notation example: +43 676 123 4567.

3. Click on Next to go to the **Privileges** dialog and check that the user has the SMS sending enabled (privileges **Sending of SMS in case of system malfunction and Sending of SMS in case of system information**).


Sending of SMS in case of system malfunction
Disabled
Notification in the client application about of system informa
Disabled
Sending of email in case of system information
Disabled
Sending of SMS in case of system information
Disabled

Testing the SMS connection

1. Generate an event by unplugging a camera from mains or network.
2. Within one minute an SMS should be received by the phone belonging to the **SMS number**.

12 Troubleshooting

This section lists a few problems and their possible solutions:

12.1 Your client connection to the server is slow and not responsive

Symptoms: The server is reacting only very slowly to your mouse clicks and operations in the client. Video streams have a big delay.

Possible reason: Probably you are working via the HTTP port 80 (e.g. because your firewall does not allow other ports) only.

Solution: You might consider to open other ports than HTTP port 80 for the client server connection (see *2.3 Configuring firewalls* on page 8).

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